COMBAT VEHICLE, ESPECIALLY ARMORED VEHICLES AND TANKS

The present invention relates to a combat vehicle, especially an armored vehicle and a tank, having a vehicle body that is carried by a chassis and in which is disposed a crew compartment, wherein an unmanned turret, which is pivotable in azimuth via a turntable disposed on the roof plate, is disposed on the upper side of the vehicle body, the turret containing a weapon that is pivotable in elevation, whereby in the region of the turret the viewing head of a panoramic viewing device is disposed.

With known combat vehicles, especially armored vehicles and tanks, in general a manned turret, which is equipped with the main weapon of the system, is disposed on a carrier vehicle; the crew is placed in the turret and looks after all objectives ranging from observation over the guidance of the system to the ordinance operation, and for this purpose have made available to them appropriate optimized viewing sensors that are also mounted at or on the turret. Such a configuration enables 360° panoramic observation with the viewing device, not only dependent upon the turret but also independent of the turret, without there resulting significant limits in the field of viewing, e.g. due to the

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turret contour itself. Furthermore, this classical concept offers the use of viewing devices having a glass optical transfer of the image from the viewing head to the viewing part (eye piece) of the operator. The optical overall efficiency of such a glass optical transfer is, in combination with the individual parameters such as viewing field size, resolution, enlargement, clear information, etc., today and in the future considered as not being capable of being physically realized by viewing systems that are based on the use of cameras having electrical image transfer to appropriate monitors or displays.

Examples of armored vehicle or tank concepts having manned turrets are KPz, Leopard 2 and SPz Marder.

A problem of such systems is that soldiers must be accommodated not only in the turret but also in the carrier vehicle, with the result that both areas must be appropriately designed to the armored protection requirements of the respective vehicle, resulting in a relatively high weight of the overall system. In modern strategy, more and more use is made of combat vehicles in remote or distant regions, as a result of which, if one wishes to ensure a rapid deployment of the appropriate forces, the upper weight limits of the combat vehicles becomes a function of the transport weight of the appropriate aircraft. For this

reason, combat vehicles have been conceived where the entire crew is accommodated in the vehicle body, so that the required personnel protection need be realized only at the vehicle body. The weapon is integrated into an unmanned turret. Furthermore, as with a manned turret solution, to ensure an extensively unlimited panoramic view, whereby also due to the turret contours no limitations in the field of viewing occur nor do the viewing devices limit the working range of the weapon, the viewing devices are mounted at or on the remotely controlled turret. For the transfer of the image information from a turret that is rotatable by n*360° relative to the carrier vehicle to the crew in the vehicle body, in general the image information of reconnaissance and target sensors are converted into electrical signals, are transferred via a collecting ring into the carrier vehicle, and are then presented at the operator sites on monitors or displays. As a result, one cannot utilize the aforementioned serious advantages of a glass optical direct viewing.

Combat vehicles having the features described above and in the introductory portion of claim 1 are known, for example, from EP 0 844 455 A2 and EP 1 061 323 A2.

The object of the invention is to embody a combat vehicle having the features from the introductory portion of claim 1 in such a way that an image transfer from the viewing head of the panoramic viewing device to the viewing part in the crew compartment is possible in a purely glass optical manner, without due to the viewing device adversely affecting the operating range of the weapon in the turret nor the viewing range of the viewing device due to the turret.

The resolution of this object is inventively effected by the features of the characterizing portion of claim 1. Advantageous further developments of the invention are described in the dependent claims.

As described below with the aid of an exemplary embodiment, it is possible with the combat vehicle equipped in the inventive manner to rotate the turret and the viewing head, or the entire viewing device, independently of one another without having interference occurring relative to one another, and none-the-less being able to transfer image information from the viewing head to the viewing part in a purely glass optical manner to the crew in the vehicle body.

An exemplary embodiment for an inventive combat vehicle is described in the following with the aid of the accompanying drawing. The drawing shows:

Fig. 1 an exploded perspective illustration of a portion of the roof plate of the combat vehicle with a viewing device and unmanned turret fixedly mounted on the hull;

Fig. 2 the components illustrated in Fig. 1 in an assembled perspective illustration.

Figs. 1 and 2 show only those parts of a combat vehicle that are important for the following explanation, with the remainder of the combat vehicle not being illustrated, namely a portion of the roof plate 1 of a vehicle body, with a non-illustrated crew compartment being disposed below the roof plate. Disposed on the upper side of the roof plate 1 is a mounting flange 1.1 for the non-illustrated turntable of the turret 2, which is disposed upon the roof plate 1 in such a way as to be pivotable in azimuth. Disposed in the turret is a weapon 3 that is pivotable in elevation. The pivoting of the turret 2, as well as the operation of the weapon and other devices within the unmanned turret, are effected remotely from the vehicle body in a non-illustrated manner.

Furthermore mounted on the roof plate 1 is a periscopic viewing or sighting device 4, the height of which is designed such that its outlook or viewing head 4 is disposed above the roof plate of the turret 2. The mounting location of the viewing device 4 is selected such that the device is coaxially disposed in the azimuthal axis of rotation of the turret 2. The viewing device is embodied as a glass optical direct viewing device, and its eyepiece or viewing part 4.2 is disposed below the roof plate 1, within the vehicle body, and is connected with the viewing device via an optical channel 4.3. Coaxial to the azimuthal axis of rotation, the turret 2 has a rotationally symmetrical passageway 2.1 that extends from the roof plate of the turret 2, through the turret, to its base plate. Extending through this passageway 2.1 is the optical viewing channel of the viewing device 4 which connects the viewing head 4.1 with the viewing part 4.2 in the crew compartment. The viewing head 4.1, or the entire viewing device 4, which is fixedly mounted to the hull, is pivotable relative to the vehicle body by n*360° independently of the position and rotation of the turret 2. The design can be such that the optical viewing channel that is guided through the passageway 2.1 of the turret 2 is disposed within a tube of the viewing device 4 that connects the viewing head 4.1 with the viewing part. In

this way, viewing part, tube and viewing head can be embodied as a common component that is pivotable independently of the turret 2.

Furthermore disposed in the roof plate 1, in a conventional manner, are entry and exit hatches 1.1, 1.2, 1.3, 1.4 and 1.5 about which are disposed reflecting mirrors or periscopes 5.1, 5.2, 5.3 and 5.4 of conventional construction.